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VISHLITSKY E30-042CON (99-200CON)
Serial No.: 09/541,158
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In the Claims

Please cancel claims 1 through 22 and add claims 23 through 44 as follows:

Claims 1-22 (canceled)

23 (new). A disk array storage device with a plurality of
logical storage devices, the disk array storage device
processing transactions with multiple tasks of different
categories to be performed in different ones of the
5 logical storage devices, said disk array storage device
comprising:

- A) means for processing the tasks according to their
respective positions of corresponding task requests
in a task request queue,
- 10 B) means for assigning priority to one of the logical
storage devices, and
- C) means for receiving a task request from any of the
logical storage devices including:
 - 15 i) category determining means for determining the
task category and the logical storage device
related to the task request,
 - ii) first transfer means for transferring a task
request of a first category to a position in the
task request queue having a first priority,

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- 20 iii) second transfer means for transferring a task
request of a second category related to the one
logical storage device to a position in the task
request queue having a second priority that is
less than the first priority, and
- 25 iv) third transfer means for transferring any other
task request to a position in the task request
queue of a third priority that is less than the
second priority.

24 (new). A disk array storage device as recited 23 wherein
said first transfer means produces a transfer of a task
request of the first category to the position in the task
request queue having the highest priority if the task
5 request is related to the one storage device.

25 (new). A disk array storage device as recited in claim 24
wherein said second transfer means transfers task requests
of the second category dependent upon an independent
operating condition and said disk array storage device
5 comprises means for establishing the independent operating
condition.

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26 (new). A disk array storage device as recited in claim 25
wherein a start command task request is generated when a
logical storage device completes processing a command and
another command is in its command queue, said category
5 determining means assigning the start command task request
to the second category.

27(new). A disk array storage device as recited in claim 25
including a memory and wherein each logical storage device
is allocated certain space in the memory whereby a write
space task requested is generated each time a logical
5 storage device attempts to use space in excess of the
allocated space, said category determining means assigning
a write space task request to the second category.

28 (new). A disk array storage device as recited in claim 25
including a memory and each logical storage device is
allocated certain space in the memory whereby a write
space task request is generated each time a logical
5 storage device attempts to use space in excess of the
allocated space and wherein said data storage facility
includes means for controlling the priority given to a
write space task, said category determining assigning a
write space task request to the second category and

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10 wherein said second category task transfer means transfers
a write space task request related to the one logical
storage device to a second priority position in the task
queue in response to said priority controlling means.

29 (new) A disk array storage device that processes
transactions with multiple tasks of first and second
categories performed in multiple logical storage devices,
said disk array storage device comprising:

- 5 A) means for processing the tasks according to the
positions of corresponding task requests in a task
request queue,
- B) means for assigning priority to one of the logical
storage devices, and
- 10 C) means for receiving a task request from any of the
logical storage devices including:
- i) category determining means for determining the
task category and the logical storage device
related to the task,
- 15 ii) first transfer means for transferring a task
request of the first category related to the
other storage devices to a position in the task
request queue of a first priority,

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- 20 iii) second transfer means for transferring a task
request of a first category related to the one
storage device to a position in the task request
queue having the highest priority, and
iv) third transfer means for transferring any other
task request to a position in the task request
25 queue with a priority that is less than the
first priority.

30 (new). A disk array storage device as recited in claim 29
wherein the other tasks include tasks in second and third
categories comprising means for transferring task requests
for second category tasks to a position of a second
5 priority in the task request queue that is less than the
first priority in response to a control function and task
requests in the third category to a position in the task
request queue that has a priority that is less than the
first and second priorities.

31 (new). A disk array storage device as recited in claim 30
wherein the disk array storage device has means for
enabling and disabling a priority change, said first
transfer means for transferring a first category task

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request related to the one logical storage device being permitted when priority changes are enabled.

32 (new). A disk array storage device as recited in claim 30 wherein the completion of the processing of one command enables the generation of a start command task when another command is in a command queue, said category
5 determining means assigning a start command task request to the second category.

33 (new). A disk array storage device as recited in claim 30 wherein the disk array storage device includes a memory and wherein each logical storage device is allocated certain space in the memory whereby a write space task is
5 generated each time a logical storage device attempts to use space in excess of its allocated space, said category determining means assigning a write space task as a task of the second category.

34 (new). A disk array storage device as recited in claim 33 wherein the disk array storage device includes priority controlling means for controlling the priority given to a write space task, said category determining means
5 assigning a write space task as a task of the second

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category and said third transfer means transfers to the
write space task request related to the one logical
storage device to a second priority position in the task
request queue when said priority controlling means enables
priority to be given.

35 (new). A disk array storage device for improving the
performance of an e-mail application program operating in
a data processing system with a host processor, said disk
array storage device including a plurality of logical
storage devices and operating in response to tasks
including reconnect tasks requested when a logical storage
device completes a task, a second category of tasks
requested in response to certain activities within the
disk array storage device and a third category of other
tasks and wherein each e-mail transaction requires the
completion of a log entry in a dedicated logical storage
device as a condition precedent to the processing of any
transaction, said disk array storage device comprising:
A) means for maintaining a task request queue for
different task requests that schedule the order by
which tasks are completed within said disk array
storage device, and

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B) means responsive to the receipt of a task request
related to any of the logical storage devices
including:

i) means for determining the task category and the
logical storage device related to the task,

ii) first transfer means for transferring a
reconnect task related to a logical storage
device other than the dedicated logical storage
device to a position in the task request queue
of a first priority,

iii) second transfer means for transferring a
reconnect task request related to the dedicated
logical storage device to that position in the
task request queue having the highest priority,

iv) third transfer means for transferring a task
request of the second category related to the
dedicated logical storage device to a position
in the task request queue with a second priority
that is less than the first priority, and

v) fourth transfer means for transferring any other
task request from the logical storage devices to
a position in the task request queue with a
priority that is less than the first priority
and second priorities.

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36(new). A disk array storage device as recited in claim 35
wherein one of the second category of tasks is a start
command task that is requested when a logical storage
device completes processing a command and another command
is in its command queue, said third transfer means
including:

- i) means for transferring a start command task
request related to the dedicated logical storage
device to a highest priority position in the
second priorities, and
- ii) means for transferring start command task
requests related to any other storage device to
the end of the task request queue at the least
priority.

37 (new). A disk array storage device as recited in claim 35
wherein one of the second category of tasks is a write
space task that is generated when storage in a cache
memory for a given logical storage device exceeds a
predetermined level, said third transfer means including:

- i) means for transferring a write space task
related to the dedicated logical storage device

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to a highest priority position in the second
priorities, and

10 ii) means for transferring write space tasks related
to the other logical storage devices to the end
of the task request queue at the least priority.

38 (new). A disk array storage device as recited in claim 37
wherein the second category of tasks additionally includes
a start command task that is requested when a logical
storage device completes processing a command and another
5 command is in its command queue, said third transfer means
including:

i) means for transferring a start command task
related to the dedicated logical storage device
to a highest priority position in the second
10 priorities, and

ii) means for transferring start command tasks
related to other logical storage devices to the
end of the task request queue at the least
priority.

39 (new). A disk array storage device as recited in claim 35
additionally comprising means for establishing a second
category transfer condition, said third transfer means

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making a transfer only when the condition exists, said
5 third transfer means otherwise transferring the task to
the end of the task request queue.

40 (new). A disk array storage device as recited in claim 39
wherein the second category transfer condition is a
percentage of operations and said third transfer means
includes means for tracking the number of second category
5 transfers from the dedicated logical storage device.

41 (new). A disk array storage device as recited in claim 40
wherein the second category of tasks includes a start
command task that is requested when a logical storage
device completes processing a command and another command
5 is in its command queue and a write space task that is
generated when storage in a cache memory for a given
storage device exceeds a predetermined level, said second
category number tracking means tracking both start command
tasks and write space tasks related to the dedicated
10 logical storage device for determining whether the
condition is met.

42 (new). A disk array storage device as recited in claim 41
additionally comprising means for establishing one of two

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operating states for processing write space tasks, said
third transfer means transferring write space tasks
5 related to the dedicated logical storage device to the end
of the task request queue during one of the states and
said second category number tracking means including means
for tracking both start command tasks and those write
space tasks that occur during the other of the operating
10 states.

43 (new). A disk array storage device for improving the
performance of an e-mail application program operating in
a data processing system with a host processor, said disk
array storage device comprising a plurality of logical
5 storage devices and operating in response to tasks
including reconnect tasks generated when a logical storage
device completes a task, a second category of tasks
generated in response to certain activities within the
disk array storage device and a third category of other
10 tasks and wherein each e-mail transaction requires a log
entry in a dedicated logical storage device as a condition
precedent to the processing of any transaction, said disk
array storage device comprising:

A) a first-in, first-out task request queue for
15 different tasks that schedules the order by which

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tasks are completed within the disk array storage device,

- 20 B) means for normally adding reconnect tasks to the beginning of the task request queue and other tasks to the end of the task request queue except for:
- C) first transfer means for transferring reconnect tasks related to the dedicated logical storage device to the head of the task request queue whereby reconnect tasks related to other logical storage devices are
- 25 transferred to a location following any reconnect task related to the dedicated logical storage device, and
- D) second transfer means for transferring a task request of the second category related to the dedicated
- 30 logical storage device to a position in the task request queue that follows any reconnect task requests in the task request queue.

44 (new). A disk array storage device as recited in claim 43 wherein the second category of tasks includes a start command task that is requested when a logical storage device completes processing a command and another command

5 is in its command queue and a write space task that is generated when storage in a cache memory for a given

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storage device exceeds a predetermined level and wherein
the disk array storage device includes enabling means for
enabling a priority change for write space tasks related
10 to the dedicated logical storage device and tracking means
for tracking the occurrence of second category tasks
related to the dedicated logical storage device, said
second transfer means comprising:

i) means for transferring a write space task
15 request related to the dedicated logical storage
device to the end of the task request queue when
the enabling means disables the write space task
priority change, and

ii) means for transferring, in response to the
20 tracking means, a write space task request
related to the dedicated logical storage device
that exists when the enabling means enables the
write space task priority change and a start
command task request related to the dedicated
25 logical storage device to a position following
any reconnect task requests in the task request
queue and otherwise transferring the second
category task requests to the end of the task
request queue.